



Cryptocurrencies & the Challenge of Global Governance*

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Abstract

The recent explosive development of new forms of digital currency opens up unprecedented opportunities and poses significant regulatory challenges. This new form of digital currency lowers the costs and other barriers to the global movement of money, international trade, foreign investment and speculation, while simultaneously enhancing the anonymity on which tax evasion, money-laundering and other illegal activities thrive. It also liberates the creation of money and regulation of economic activities from the political control of national governments and central banks. Since the value of a currency is related to the size of the population, strength of the economy and value of transactions that utilize it, a basket of cryptocurrencies could emerge as the first prototype of a world currency whose value is backed by the total productive capacity of the entire human community. Moreover, the triad of Internet, distributed ledger technologies and cryptocurrencies could serve as the basis for the development of new global economic potentials in a manner similar and a degree far exceeding the economic impact of the World Wide Web over the past two decades. At the same time, the rapid deployment of cryptocurrencies could have profound impact on the capacity of governments to tax transactions, income and wealth, one of the main pillars of the modern nation state. The development of autonomous global cryptocurrencies could dramatically reduce the control and effectiveness of existing regulatory mechanisms at the national level and generate considerable pressure for the evolution of more effective institutions for global governance. They could provide compelling incentives for national governments to enhance international cooperation and strengthen the functioning of international institutions to fill the regulatory void. International organizations will play an important role in harnessing the potentials and minimizing the risks arising from the growing usage of cryptocurrencies. Most of the research conducted by central banks on cryptocurrencies over the past four years has focused on risks and benefits as viewed from the perspective of national economies and national monetary systems. This paper explores the global prospects and potential implications of the widespread adoption of cryptocurrencies for cross-border transactions and the role of international institutions in their regulation and global fiscal governance.

1. Globalization of Economy and Global Governance

Over the past few millennia, humanity has evolved from an organization of villages, tribes, city-states and petty kingdoms into an international system of nation-states. It is now in the process of moving beyond nation-states to form a more closely integrated global

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community with effective institutions for global governance. The evolution of the global economy and international financial markets constitutes an important component of this wider social movement. Since the end of the Cold War, the process of integration has dramatically accelerated, with momentous positive and negative consequences. The dissolution of the Berlin Wall, the Iron Curtain, the Soviet Union, Warsaw Pact and the division of Germany led to a drastic reduction in nuclear stockpiles, the rapid spread of democracy, a rising tide of international travel and immigration, the explosive growth of global communications, the globalization of media, a vast expansion of international civil society institutions and the emergence of the first truly global social institution—the World Wide Web. In the absence of effective structures for regulation and governance, these developments also resulted in the proliferation of nuclear weapon states, civil war and the breakup of Yugoslavia, rising intercultural tensions and terrorism.

Economically, the end of the Cold War led to the establishment of the WTO, a dramatic expansion of global trade, rapid development of the EU and the Eurozone, deregulation and expansion of global banking, rapid growth of international financial markets and foreign investment, an increasing financialization of economies, the globalization of markets, the globalization of production and supply chains, vigorous competition between nation-states to provide attractive conditions for business investment and jobs, greater autonomy for multinational corporations no longer dependent on any one nation for their base and gave global prominence to neoliberal economic theory and policies. These developments were accompanied by a four-fold growth of world trade in merchandise and services between 1990 and 2008, a sevenfold expansion of foreign direct investment, a 3.5 fold rise in international financial assets and a 2.5 fold growth in the share of foreign investors in global equities markets.*†

2. The Wild West of Finance

The process of globalization dates back centuries. But during the past 75 years, the speed and magnitude of the movement have reached a critical stage where the existing social organization is increasingly inadequate to manage the energies released by the process. Money is a form of social energy, which grows by movement. The more rapidly it moves, the faster it grows. Organization transforms raw energy into productive power, the way a dam and hydroelectric power plant convert the kinetic movement of a raging river into useful electricity. When the organization is insufficient to contain the power generated, it can generate a short circuit, a breakdown or an explosion. Like other forms of energy, money requires an appropriate structure to harness and apply its power constructively. When the power released is greater than the carrying capacity of the organization designed to contain it—in this case, the financial organization, it can result in devastating damage to the wider social fabric.

In the absence of effective structures for economic regulation and governance of an increasingly integrated global market, the opening up of global markets has generated

* Based on WTO: 2008 Press Releases. (2008) *WTO: developing, transition economies cushion trade slowdown* http://www.wto.org/english/news_e/pres08_e/pr520_e.htm

† See <https://www.statista.com/statistics/376613/global-financial-assets-value/>

a ‘Wild West’ of finance, a global casino for financial speculation, the rapid growth of international tax havens, the accelerated decline of organized labor, the reduced share of labor in corporate earnings, and rising levels of income inequality not witnessed since the 1920s. The transformation of the 2008 Subprime Mortgage Crisis into a global financial crisis was a direct consequence of the gap between national level financial management and the globalization of finance. There are striking parallels between the instability of US financial markets in the early part of the 20th century and in global financial markets today. Now, as then, the market is dominated by highly leveraged funds in search of highly speculative returns, rather than productive investment. In 1973 the value of global foreign exchange transactions was twice the value of world trade. By 2008 annual international financial flows were equivalent to 114 times the value of goods and services traded globally and roughly 1300 times annual foreign direct investment.*

In response to the economic consequences of globalization, unprecedented efforts have been made to increase international cooperation and strengthen international institutions to establish more effective guidelines, policies and regulatory mechanisms to manage the global economic space. Coordinated action to enhance financial and securities regulation is among the most visible and significant of these efforts. But significant progress has also been made in evolving more uniform standards for economic measures and indicators, accounting and quality standards, uniform commercial law, trade policies, economic intelligence and measures to reduce money-laundering and tax evasion.

It is in this context that we need to examine the sudden and dramatic development of cyber currencies over the past few years in order to assess both their potential benefits and threats to the global economic system, the regulatory challenges they pose and the determinative role that international institutions can play in the management and regulation of this new form of money. This paper explores the prospects and potential implications of the global adoption of digital currencies and the role of international institutions in their regulation and governance.

3. Cryptocurrencies

The term cryptocurrency (CC) refers to a subclass of digital or virtual currencies which utilize blockchain or distributed ledger technology (DLT) as a consensus mechanism for recording transactions.¹ The observations in this paper are made with reference to cryptocurrencies such as Bitcoin, Ethereum and Ripple, with the following characteristics. Based on DLT, they are designed to work as a medium of exchange over the internet. They are not issued by central banks, credit institutions or e-money institutions. They are based on cryptographic algorithms, including those that determine, under what circumstances and how, new units of currency can be created. They are not subject to centralized control. They are denominated in their own currency. Their ownership can be determined and modified cryptographically.[†] The safety, integrity and balancing of ledgers used to record and validate

* UNCTAD Press Release. (2008) *Foreign Direct Investment Reached New Record in 2007*, United Nations. <http://unctad.org/en/Pages/PressReleaseArchive.aspx?ReferenceDocId=9439>

† The blockchain is a public ledger that can be used to record cryptocurrency and other types of transactions. A novel solution accomplishes this without any trusted central authority: the maintenance of the blockchain is performed by a network of communicating nodes.

CC transactions are maintained by members of the general public using their computers, with a particular timestamping scheme instead of relying on a trusted third party for validation. The recording of transactions in CCs does not specify the identity of the parties involved. Today there are more than 1000 different types of CCs with these characteristics in circulation with a total market capitalization of approx. 350 billion USD. Of these, more than 40 reached a market cap of more than \$1 billion in early 2018.

CC is an electronic form of money similar in some respects to the money deposited in bank accounts and in electronic wallets. The central innovation distinguishing CCs is the capacity for peer-to-peer exchange much like cash without requiring the mediation of financial institutions. Unlike banknotes and coins, CCs are intangible and can be instantly transferred and exchanged electronically around the world. Conventional electronic transfer systems such as Visa, SWIFT, PayPal and those employed in securities trading require proprietary transactional record-keeping by a chain of intermediating institutions, which involves significant costs and delays in the processing of transactions. In contrast, transactions involving CCs are recorded by DLT systems on the Internet and can be carried out and confirmed instantaneously at very low cost and with total anonymity. Conventional international financial transactions are usually carried out in two or more national currencies whose rates of exchange are subject to fluctuation over time, whereas CC transactions take place in a borderless global environment in which transactions between parties in different countries can be conducted in the same currency without conversion.*

4. Regulatory Concerns

The rapid development of cryptocurrencies has raised a host of regulatory concerns at the national and global level which nation states and international organizations are just beginning to understand and grapple with, including the lack of a proper legal structure for stewardship. Premature legislation or regulation could stifle the blockchain revolution. Business development may outpace scientific research and policy formulation. Powerful incumbents might usurp domains.²

The legal status of CCs varies from country to country and is subject to frequent changes as governments and central banks study and revise their views and approach. The anonymity and lack of regulations associated with CCs have raised serious concerns that they facilitate money laundering, tax evasion, drug traffic and other forms of criminal activity. So currently, CCs are not recognized as legal tender and CC transactions by consumers and investors are not protected by government regulations or oversight. Recent instances of large scale theft from cryptocurrency exchanges have increased security concerns.

But the most serious concerns about CCs relate to their impact on the ability of national governments to generate revenue and the ability of central banks to conduct monetary policy in case the use of CCs becomes significantly large in comparison with the use of national currencies.³ A substitution of sovereign money by private digital currencies would also lower a government's seigniorage income.⁴ The borderless character of CCs has profound implications for national governments. CCs are not subject to creation, control and

* A major exception to this rule is dollar denominated international transactions which also involve a single currency.

management by the conventional monetary policy instruments utilized by central banks with regard to their own national currencies. National governments have no control over either the creation of CCs or the interest rates at which they are borrowed and lent. Instead, control is governed by fixed computer algorithms defined at the time the CC is created and not subject to alteration by government. The decentralized nature of CCs prevents any nation from shutting down the network or altering its technical rules. However, the exchanges used for purchase and sale of CCs within any given country can be banned and blocked. Furthermore, the anonymity presently associated with CCs could severely aggravate the problems national governments face in taxing incomes and transactions. A largescale shift to global CCs as a store of value could effectively place a vast proportion of transactions and wealth beyond the reach of national governments to monitor tax.

Since the emphasis of this paper is on the implications of cryptocurrencies for global systems, it is not appropriate to dwell on their possible use by national governments. But it should be noted that considerable attention is being given by national central banks to the pros and cons of introducing Central Bank Digital Currencies (CBDC) which could be directly issued to the public without the intermediation of banks. The creation of Central Bank Digital Currencies could be used to provide a direct channel for central banks to conduct monetary policy without the intermediation of banks. A CBDC would very probably increase the role of a national currency on foreign exchange markets, as an international reserve medium, and as an alternative currency for countries in macroeconomic turmoil. If CBDCs were to replace physical currency, they would also reduce the zero lower bound restriction on negative interest rates as a monetary stimulus.⁵ This could even make it possible to replace the fractional reserve banking system with one that dramatically reduces the concentration of economic, political and social power held by private financial institutions.

5. The Value of CCs

The emergence of digital and cyber currencies represents a marriage of three all-powerful human inventions—with momentous implications for the future of humanity. Language, money and the Internet rank among the greatest human inventions of all time. All three are powerful networking tools, instruments and catalysts to promote effective, mutually beneficial human relations. Without language, communication between individuals, human settlements, social organization, economic cooperation, spread of knowledge, education, science, and all the higher achievements of civilization would be unthinkable. **Money permits the exchange of value generated by one party in one place and point of time with any other party in any other time or place in which the same currency is accepted or can be exchanged for another accepted currency.** Without money, the physical exchange of products and specialization of economic functions would be reduced to rudimentary levels. Modern civilization would be unthinkable. Money is the language of economic relations. And like other languages, it both facilitates and retards effective communication, depending on the geographic area and size of the population which shares a common medium of exchange or effective systems for interconversion. Internet is a standardized language and system for global communications and relations which links, relates and integrates human activities

around the world. In combination they open up unparalleled and unimaginable opportunities for social innovation.

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Money also has much in common with a wider array of creative social organizations such as law, government, democracy, industrialization, science, education, religion, international institutions, and, most recently, networking technologies, artificial intelligence and robotics. All these remarkable human inventions have contributed immensely to the progress of civilization and culture. Yet in each case human beings have exhibited a marked tendency to subordinate themselves to the powers of their own creation as unthinking, dependent, helpless slaves. Money has become a victim of this syndrome and currently exerts a ruthless domination over the global society it is intended to serve. The emergence of cryptocurrencies has the potential to break that domination and liberate the immense untapped creative potential of money or to generate new forms of domination and subordination that further limit social progress.

Critics take the view that CCs are forms of Ponzi and pyramid schemes, which lack the backing of any real asset. The soaring value of CCs during 2017 led many to conclude that they are a purely speculative vehicle with no inherent value. Last year the value of Bitcoin rose from \$900 in January 2017 to almost \$20,000 in late December before the bubble burst and the price fell precipitously back to \$8000 in early 2018. This rampant speculation and the fact that CCs are not backed by precious metals, real property or by governments with established revenue streams does not necessarily mean that CCs are without any real inherent value. But an assessment of the potential value and utility of CCs needs to take into account the characteristics of other types of fiat currency prevalent today.

National currencies today are backed by limited gold reserves, tax revenue streams, and the value of all government-owned assets. Indirectly, they are also backed by the total productive assets and productive capabilities of the nation, which lend support to the public confidence and trustworthiness of a national currency. But, in final analysis the value and utility of any national currency depend on the perceived level of public confidence and trust which motivates users to accept the currency in exchange for property, goods and services. Where that confidence is lacking, as during periods of hyperinflation, depression, political instability or imminent threats such as war, the value and acceptability of a national currency can plunge dramatically.

The total value of all cryptocurrencies today is estimated at around 350 billion USD. These currencies are not backed by gold, tax revenue streams, other physical assets, or national

productive potential. On what then, if anything, is this valuation of \$350 billion based? A significant portion of it is, no doubt, currently based on purely speculative expectation that investors will continue to buy large quantities of the currency, thereby driving up its price in future. If that and that alone is the underlying source of value, then it could be said that CCs have no intrinsic value or utility. But it is not. Apart from their speculative value during this still formative period of their development, CCs derive real economic value from several important sources:

“While CCs are still in a nascent stage of development, their enormous potential for technological and organizational innovations opens up untold possibilities at the national and global level.”

5.1. Low Cost, High Speed Medium of Foreign Exchange

CCs are presently the only universal currencies that can be utilized throughout the world and transferred rapidly at low cost without incurring the normal foreign exchange transaction fees incurred on exchange of national currencies through the mediation of banks.⁶ These costs include the cost of conversion between national currencies, the risks associated with fluctuating exchange rates, and the service fees charged by financial institutions for conversion and transfer. For example, international credit card transactions typically involve a 3% service charge. In 2016, the total volume of international currency transfers exceeded \$150 trillion, of which \$3 trillion were transfers by individuals and the rest by institutions.⁷ The total commission paid on individual transfers was estimated at \$165 billion. Goldman Sachs estimates the average total transmission costs through traditional remitters of 8-9%, compared to 0.1% and 3% for CCs.⁸

The efficiency of current economic and financial systems at the global level is far lower than at the national level where uniform policies can be imposed over vast areas, effective systems for regulation and enforcement are in place, efficient systems for monitoring and control are already established, and cross-border barriers are non-existent. Judged from this perspective, global markets for both trade and investment are still in a relatively early stage of evolution. CCs have the potential for enhancing the global availability of money for productive economic activity by overcoming some of the limitations of national currencies and credit systems with far greater speed, reach and efficiency than barter, complementary currencies and other supplementary exchange systems.

5.2. Financial Inclusion and Utilization of Untapped Global Economic Capacity

The second source of value arises from the capacity of CCs to enhance trust, which is the basis for economic networking. The total value of any currency increases in proportion to the size of population and the productivity of the economic area in which it is accepted. The

rationale for creation of the Eurozone was to eliminate the high transaction costs involved in trade between countries using different national currencies. As CCs spread globally, their value is likely to rise continuously, since increasing acceptance would increase demand for a limited supply. While CCs are still in a nascent stage of development, their enormous potential for technological and organizational innovations opens up untold possibilities at the national and global level. Christine Lagarde, Managing Director of IMF, stated that “the technology behind these assets—including blockchain—is an exciting advancement that could help revolutionize fields beyond finance. It could, for example, power financial inclusion by providing new, low-cost payment methods to those who lack bank accounts and in the process empower millions in low-income countries.”⁹ CCs have the capacity to also promote financial inclusion of the 2.5 billion people who do not currently operate bank accounts due to the high cost of bank charges or the paucity of banks in remote areas.¹⁰

No monetary system fully taps the economic potential of the society it serves. That is one of the reasons why barter trade continues to exist on a significant scale in the 21st century. According to the International Reciprocal Trade Association (IRTA), the value of barter trade is currently between \$12 and 14 billion annually.* It has been estimated that approximately two-thirds of America’s Fortune 500 companies engage in barter trade. The incapacity of national monetary systems to serve as an effective catalyst for all potential economic activity is also the principal reason for the development of alternative forms of money to supplement national currencies, such as the more than 300 complementary and local currencies being utilized worldwide to enhance purchasing power and facilitate additional financial transactions. The principal rationale for the creation of local currencies is that the national currency system and existing monetary markets are not efficient in facilitating all potential transactions between those with the capacity and intention to exchange goods and services. This underutilized potential includes the unemployed, underemployed and other persons with marketable knowledge, skills and underutilized productive capacities which are in demand.

The availability of workers with surplus productive capacity and unmet needs is the most obvious example. ILO estimates total global unemployment exceeded 200 million persons in 2017.¹¹ Global underemployment is much more difficult to measure. It includes underutilization of available full-time and part-time manpower willing and able to work, underutilization of the knowledge and skills of the global workforce and those outside the workforce who are willing to provide useful goods and services, and underutilization of global productive capacities due to insufficiency of purchasing power in conventional currencies. To cite only one crude indicator of underemployment, the global average of full-time workers per adult population is only 26%, compared to 30-52% in developed countries and 5-20% in most of Africa.¹² The overall global underemployment could well exceed two billion person years annually or even more. Complementary and local currencies, most of which are circulated within the confines of small regions within countries, seek to tap this underutilized potential for transactions, but are difficult to establish and costly to operate due to the small area and volume of transactions they perform.

* <https://www.irta.com/>

5.3. Creation of New Social Potential

CCs also have the capacity in conjunction with the Internet and the other technologies on which they are based to create new and additional potential. They are a creative form of money, creative of new economic potential. Lagarde has also observed that CCs “have the potential to displace central banks, conventional banking and national monies in the long term.”¹³

Organization has a remarkable power to spur social advances, yet in the process every organization also carries with it self-imposed limitations and barriers to further social development. Every monetary system imposes restrictions on the creation and circulation of money which limit its capacity to promote economic activity and wealth creation. For example, policies regarding issuance of bank loans impose limits on credit to prospective borrowers with real economic potential who lack assets to offer as security. Monetary systems are always seeking novel ways to extend the issuance of credit without undue risk to lenders. The introduction of co-signer provisions on educational loans in the USA has spurred the growth of student loans to nearly \$1.5 trillion, compared to only \$620 billion total US credit card loans. The issuance of these educational loans is based on the premise and supporting data that shows higher levels of education will result in higher levels of future employment and earnings. Even when these loans involve co-signers, the underlying asset which makes the loans viable is the future earning capacity of those who acquire higher levels of education. The ‘security’ for the loans is primarily in the form of trust in the future earning capacity of the borrowers. Note that US educational loans are extended almost exclusively to students studying in America or to American students studying overseas, rather than to all human beings globally seeking higher education to enhance their employability and earning capacity. The effective functioning of a monetary system to promote economic activity within one currency zone does not mean that overall economic potential is being tapped globally. This points to one of the principal limitations of national currency systems. Their effectiveness as catalysts for economic activity is maximum within countries and common currency zones and far less effective outside those zones.

New business models such as Uber and Airbnb increase the utilization of existing social potential by providing ways to more fully and efficiently commercialize the value of existing assets, e.g. underutilized vehicles and drivers, available residential space for rent, whereas educational loans actually create new social capacity by promoting investment in human capital to make people more productive. Like education loans, innovative applications of CCs also have the potential to promote investment in new types of technologies, activities and organizations that create and develop new forms of social potential, similar in potential to the innovations introduced by Amazon, Google AdWords, iTunes and Facebook.

6. Pros and Cons of Global Currency

The benefit of reducing the financial risks and transaction costs was a principal rationale for the creation of the Euro and the Eurozone as well as other regional currencies. The recent Euro Crisis has highlighted the problems arising when nations relinquish sovereign national

currencies in the absence of centralized political and economic institutions empowered to conduct fiscal and monetary policy for the entire monetary zone. The political difficulty in building support for centralized control at the level of the Eurozone was a major contributing factor for the recent Euro Crisis. But it seems unlikely that such centralized control will be granted by the participating nations in the near future, given the recent political backlash against the Euro and the EU among some member nations.

The potential benefits of establishing a single global currency union based on establishment of a World Central Bank and a World Currency have been considered for decades. Both Britain and the USA came to the Bretton Woods conference in 1944 with proposals for establishment of a global currency. The British supported a plan developed by Keynes for a world reserve currency called the ‘bancor’ administered by a central bank vested with the power to create money. US President Franklin D. Roosevelt directed his Secretary of the Treasury, Henry Morgenthau Jr., to also develop plans for a global currency, though the US subsequently withdrew support for domestic political reasons.¹⁴

The final plan for establishment of the International Monetary Fund, which focused on maintaining international price stability, created a fixed pool of national currencies as opposed to a world central bank capable of creating money. The system served adequately until the late 1960s, when it was overtaken by the vast expansion of international financial transactions, increasing levels of monetary interdependence, the emergence of international banking consortia, and—with the rise of Europe and Japan—a more widespread distribution of global economic power. In recent years a number of eminent economists have argued strongly in favor of a radical revamping of the international financial system, including proposals for establishment of a global financial authority with powers far exceeding those of the IMF and Bank for International Settlements (BIS) and a global currency to be utilized either in parallel with or in place of the present cumbersome and costly system of national currencies.

In the early 1980s, the American economist Richard N. Cooper, a Yale Professor and US Undersecretary of State for Economic Affairs under President Carter, proposed a ‘radical scheme’ for the 21st century—“creation of a common currency for all the industrial democracies with a common monetary policy and a joint Bank of Issue to determine that monetary policy.” With foresight, he observed that when communication, transport, technology dissemination, trade in both goods and services, corporate strategy, banking and investment become global and expansive catalysts of world development, a national level monetary system is out of sync and no longer a viable option. Arguing that national level regulation cannot be fully effective in a global market, Cooper proposed five central banking requirements needed to convert the IMF into a world central bank empowered to issue a common world currency.¹⁵ In 2006, Nobel laureate Joseph Stiglitz proposed that the adoption of Special Drawing Rights (SDRs) as a reserve currency by the national central banks could pave the way for the eventual creation of a single world currency.¹⁶ In 1999 another Nobel laureate, Robert Mundell, strongly advocated introduction of a common world currency. “The benefits from a world currency would be enormous. Prices all over the world would be denominated in the same unit and would be kept equal in different parts of the world to the

extent that the law of one price was allowed to work itself out. Apart from tariffs and controls, trade between countries would be as easy as it is between states of the United States. It would lead to an enormous increase in the gains from trade and real incomes of all countries including the United States.”¹⁷ Mundell suggested that a Global Central Bank could issue a global currency backed by reserves of dollars, yen, euros, and gold.¹⁸ In spite of serious economic backing, proposals such as these still encounter the skepticism which precedes every new stage of the world’s evolutionary social progress.

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Conservative central bankers and politicians—intent on preserving national sovereignty over management of the domestic economy at a time when international market forces are challenging the very notion of national markets—no doubt scuff at the proposal of a world currency, but it may not take much to turn the tide of opinion in the other direction. As Mundell observed, “It looks as if we are a long way from that position [a Global Currency] now. Yet it is surprising how quickly moods can change and producers of statecraft can escape the old modes of thought.”¹⁹ Eatwell and Taylor sounded a similar note in calling for establishment of a World Financial Authority and fully empowering the IMF as a true lender of last resort to the international community.* “What is utopian one day is conventional wisdom the next.”²⁰

7. Cryptocurrencies and the Role of International Organizations in their Regulation

Given the controversy and significant difficulties in establishing a world currency with centralized authority to conduct fiscal and monetary policy, the question remains as to whether cryptocurrencies have the potential to play a constructive role in the global financial system and what type of regulatory agency would be required to provide effective control over their misuse, including misuse of CCs for speculation, tax evasion and other types of criminal activity.

Interest in CCs has been fueled by the euphoria often associated with new types of speculative investment. Speculation is not a crime, but it is a major source of the increasing financial instability witnessed over the past three decades and the diversion of potential investment from the real economy, which in turn has contributed significantly to rising levels of unemployment and of rising economic inequality. Controlling all forms of speculation is

* The IMF has assumed some powers as a lender of last resort after the Mexican bond crisis in 1994 and the East Asian Crisis in 1998. However, it is hampered by several limitations; notably, the limits on how much it can lend and the slow and cumbersome process by which members must collectively approve such action. Thus, it lacks the ability to inject liquidity as and when required unconditionally and without limit as national central banks do now.

extremely difficult, given the immense political power and influence of the wealthy and the financial institutions that profit by their activities. But controlling or eliminating speculation in CCs as a condition for their legal recognition could be feasible at the nascent stage in their development by imposing a tax on high frequency, short term trading in exchange for national currencies, gold and similar assets. This would make CCs almost unique as an asset that does not lend itself to the unpredictable price fluctuations and instability associated with other forms of speculative investment.

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Control of the use of CCs for tax evasion and criminal activity could be severely constrained by removing the anonymity associated with CC transactions or simply banning those that are not linked to bank accounts in countries enforcing international cooperation to prevent tax evasion and criminal behavior. Thus a two-pronged strategy could be put into force supporting the legal use of CCs that meet these conditions and prohibiting currency exchanges trading in those that do not.

In order to be fully effective, either or both of these forms of regulation would need to be formulated, managed and uniformly enforced at the global level. Otherwise, activity would only shift from cryptocurrencies which impose these restrictions to those that do not. Management and enforcement of this regulatory regime could be carried out under the authority of the IMF, Bank of International Settlements, Basel Committee on Banking Supervision, the Financial Stability Board, and Financial Action Task Force on Money Laundering, or an entirely new agency established specifically for that purpose.

This approach could lead to the development of global currencies freed from prominent limitations of national currencies. It would permit demonstration and experimentation with a new species of global money while limiting the risks involved in a wholesale shift to a single world currency. It might also serve as an effective means to develop and test political and economic systems for global financial governance on a limited scale for a specific purpose.

Effective management of a global CC or a system of CCs could best be achieved by authorization of an international organization missioned to promote the optimal and equitable development of the entire global economy rather than one representing the competing interests of sovereign nation-states vying with one another for advantage. One or more such systems could initially be established by a relatively small group of nations and opened to all those who accept the underlying principles on which they are based.

8. Global Prospects and Opportunities

The current polyculture of national currencies represents a stage in the long evolution of human society and economic systems from the local to the global level. National currency systems have existed for many centuries but the global system of interconvertible currencies only reached maturity in the 20th century. In spite of its enormous contribution to facilitating growth and development of the global economy, it remains fraught with such cumbersome and costly limitations that the quest for a more effective global system is essential and inevitable. CCs in their present form may not offer a clear overall solution, but they do open up new possibilities worthy of serious examination and exploration as an intermediate stage or possible route to a more effective global monetary system or monetary union in the future.

Early advocates of CCs such as Don and Alex Tapscott remind us that governance need not be synonymous with centralized governmental control. The Internet is the best example of a complex global social organization that has evolved and transformed itself largely by means of decentralized multi-stakeholder networks operating as governance structures. They argue that a variety of similar networks should be fostered to evolve effective standards, policies and regulations appropriate to support socially-beneficial innovation of CCs and other blockchain applications. Government surely has an essential role to play, but that role will be most effective when it is conducted in collaboration with the wide range of stakeholders designing, developing, launching, investing and using CCs, including technical experts, entrepreneurs, investors, civil society organizations, end users and the general public.²¹

The advent of digital currencies is too recent and their potentials too vast to be fully recognized at this early stage, but some general conclusions can be set forth and some of their most significant possibilities can be identified for future research and experimentation.

1. CCs are a relatively simple and low cost method of extending the range of monetary financial transactions without radically altering the existing national currency system. The global nature of CCs makes them a natural and attractive means for reducing and eventually eliminating the high costs and cumbersome procedures associated with transactions between parties in different nation-states using different national currencies.
2. A basket or polyculture of CCs with easy, low cost interconvertibility could moderate the risks of depending on a single monopolistic cryptocurrency. Competition between a polyculture of CCs would provide opportunities for rapid experimentation in order to test a wide range of new models in much the same way the internet makes possible rapid innovation.
3. The blockchain or distributed ledger technology which serves as the backbone for CCs opens up the possibility of programming new currencies to automatically and transparently address some of the problems confronting national currencies.
4. Experiments with different forms of CC might include some with algorithms designed to increase the supply of currency in proportion to the growth in usage of the CC. Algorithms could be designed to automatically modulate the rate of creation of a CC to synchronize with the number and volume of transactions made to ensure sufficient

liquidity to support an expanding community of users and a widening economic zone, without resulting in sharp variations in the conversion rate of the CC to other benchmark currencies.

5. Developing CCs with inbuilt safeguards to reduce and discourage high frequency currency speculation could vastly reduce dependence on huge total global foreign exchange reserves held by governments to reduce the risks, uncertainty, insecurity and destabilizing impact of foreign currency speculation and its deleterious impact on the global economy. Those reserves exceeded \$9.5 trillion in 2017. This might be achievable by the introduction of a stable globally accepted CC based on algorithms that impose high fees on large, short term purchase and sale. The income from the fees could be invested in further development of the system or distributed to other currency holders as a reward for use of the system.
6. Algorithms could also be designed to impose negative or positive interest rates to encourage usage rather than saving of CCs under circumstances when economic indicators point to the need to stimulate or moderate the volume of economic activity.
7. Blockchain technology combined with other technologies has the potential to significantly reduce the obstacles and costs of complying with know-your-customer regulations and validation of digital identities.²² While current CCs offer near complete anonymity to their users, it is feasible to introduce CCs in which transparency of ownership is equal to or greater than that of today's bank accounts. This would act as a serious deterrent to the use of CCs for illegal purposes and provide access for law enforcement agencies to monitor use of funds in an easier, more effective means than is presently possible.
8. Specialized types of CCs could also be created to serve specific purposes. For example, a transparent monetary system could mitigate the role of money in politics by making it possible to trace the source of all funds flowing to electoral candidates. It might be possible for governments to stipulate that all contributions to election campaigns by individuals, corporations and other organizations and that all electoral expenditures on advertising and public communication campaigns only be made in a specially designed CC subject to complete and automatic public transparency.

These and similar innovations underline the fact that we are still in the earliest stage of the development of CCs, akin to the time when the Internet was primarily used for email and file transfers. It would be unfortunate if out of fear of possible loss of control, national governments were to prematurely stifle experimentation and experience with this new financial networking tool. At the same time, the risks are too great to permit their unbridled development without close monitoring and regulatory powers to mitigate misuse. Under these conditions, management by international institutions is the most effective strategy for fostering positive innovations conducive to the fullest and most equitable development of the contribution of CCs to global human welfare and well-being.

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